

## Flexion contracture in 2-5 digits following hypothenar flap

Flexion contracture following hypothenar flap

Harun Köse<sup>1</sup>, Serhat Ekrem<sup>1</sup>, Ahmet Sağır<sup>2</sup>, Ersen Türkmen<sup>3</sup>, Kadir Ertem<sup>1</sup><sup>1</sup> Department of Orthopedic and Trauma Surgery, Faculty of Medicine, Inonu University, Malatya<sup>2</sup> Department of Orthopedic and Trauma Surgery, Kadiri State Hospital, Osmaniye<sup>3</sup> Department of Orthopedic and Trauma Surgery, Polatli State Hospital, Ankara, Turkey**Abstract**

We aimed to discuss a case of severe flexion contractures affecting 2nd-5th fingers as a late complication of a hypothenar skin flap that we applied to a patient with a fingertip injury that ended with tissue loss in the tip of the fifth finger of the right hand. Soft tissue defects of the little finger are challenging, especially when a bone, tendon or vascular pedicle is exposed because of trauma. The hypothenar random flap is easy to harvest and has a good color and texture match to the little finger pulp. For this complication, which did not improve sufficiently with physical therapy methods, contractures were tried to be eliminated by open surgical release of the 2nd-5th fingers to the proximal interphalangeal joints.

**Keywords**

Hypothenar Flap, Contracture, Injury, Finger

DOI: 10.4328/ACAM.20925 Received: 2021-12-16 Accepted: 2022-09-12 Published Online: 2022-09-28 Printed: 2022-10-20 Ann Clin Anal Med 2022;13(Suppl. 2):S127-129  
Corresponding Author: Harun Köse, Department of Orthopedic and Trauma Surgery, Inonu University, Faculty of Medicine, Bulgurlu Neighborhood Elazig Road 15th km No:4 44280, Malatya, Turkey.

E-mail: harunkose925@gmail.com P: +90 506 206 18 96

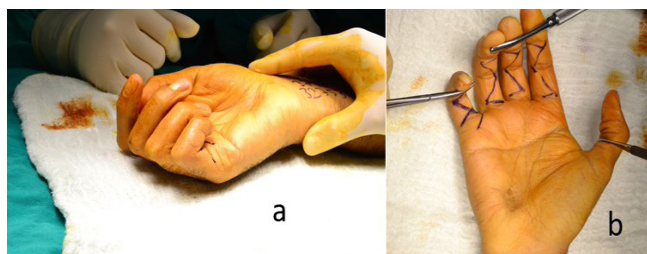
Corresponding Author ORCID ID: <https://orcid.org/0000-0002-6549-4166>

## Introduction

Fingertip amputations are the most common type of amputation of the upper extremity. There are many treatment options for fingertip amputations. Treatment method may vary widely from healing by secondary intention to replantation of the amputation, depending on the level of the amputation and the tissue components involved. The aim of the treatment is to achieve the best functional and aesthetic result with the least pain in the shortest time.

The thenar flap is a satisfactory reconstruction technique for the treatment of fingertip injuries of the index and middle fingers, and the hypothenar flap is a satisfactory reconstruction technique for 4th and 5th fingertip injuries. As in this study, this flap is reliable and provides adequate coverage to the missing finger pulp. Flap sensitivity is good. Transferring a distal-based flap prevents proximal interphalangeal joint contracture and allows the surgeon to better reconstruct the outline of the distal phalanx [1].

In this case report, we present a case of flexion contracture affecting the PIP joints of the 2nd-5th fingers as a complication of hypothenar flap surgery.



**Figure 1.** (a). Preoperative view of the contracted fingers, b. Planned Bruner skin incisions for contracture release



**Figure 2.** Intraoperative view of volar plate release



**Figure 3.** Nearly total passive flexion following surgical release

## Case Report

A 38-year-old male patient applied to the emergency department of our hospital on 31.05.2019 with a crush-laceration injury involving the distal end of the fifth finger of the right hand. The injury related to a wrap and pull with a rope resulted in a total amputation of the fingertip. Hypothenar random flap, which is a preferred 2-stage method for fingertip injury of the little finger, was applied to the patient. The skin defect in the hypothenar region was closed with a full-thickness skin graft taken from the medial region of the right wrist. The graft donor area was primarily sutured. After 23 days, the hypothenar flap was separated. It was observed that the blood supply of the finger pulp was sufficient and the healing of donor areas was normal. It was noted that flexion contracture developed in the 2nd, 3rd, 4th and 5th fingers of the patient during the postoperative 28th-day follow-up (Figure 1a). Physical examination revealed a 25-degree flexion contracture at the DIP (Distal interphalangeal) joint of the 5th finger. In the PIP (proximal interphalangeal) joint, the active and passive flexion contractures at 2nd-5th PIP joints were found to be 20,30,40 and 50 degrees respectively. On 18.11.2020, contracture release surgery was planned and the skin was incised with Bruner incisions to open the flexion contractures of the 2nd-5th fingers of the right hand (Figure 1b). The volar plates in the contracted fingers were freed proximally. In addition, FDS (Flexor digitorum superficialis) tenotomy was performed on the 5th finger at the level of a3 pulley in order to overcome the contracture. Moreover, the ulnar side of the FDS tendon of the 4th digit had to be cut. Subsequently, it was observed that the fingers came to full extension passively (Figure 2). The skin was regularly closed primarily (Figure 3). Controlled active motion was started 3 days after the operation and a position-preserving night splint was recommended for 6 weeks. A preoperative consent form was obtained from the patient.

## Discussion

Fingers are very important organs and various finger reconstructions have been reported. The basic goals of any fingertip reconstruction are to maintain digital length and volume, minimize aesthetic loss and preserve finger function [2]. Treatment options vary depending on the injury mechanism, defect's size and plane, surgeon's intention, patient's needs, condition of the stump and the amputated part. However, there is a consensus that replantation is the best choice for maintaining the length of the finger and the normal anatomy of the nail complex, if only the amputated fragment is available, in replantable condition and well preserved [3]. The Atasoy flap, the Kutler flap, cross finger flap, thenar and hypothenar flaps, digital perforator artery flap are among the most commonly used options in emergencies [4]. These flaps require gradual operations and prolonged immobilization results in joint stiffness [5]. To the best of our knowledge, our case is the first case of multiple finger contracture after one finger flap construction. All four fingers had to be operated on to relieve joint stiffness.

Careful flap selection, preoperative planning, and patient compliance with the planned treatment are crucial in the coverage of the pulp defect, preservation of finger length,

prevention of adjacent joint contracture, and minimizing donor site morbidity [6]. In our case, the patient did not follow our postoperative instructions. The patient was recommended to perform passive range of motion exercises to prevent contractures. At the 4th week visit, we detected the contractures and the patient was consulted by the physiotherapy team. The patient did not perform physio and came back to follow up at our clinic one and half year later. The flexor tenolysis was performed to release contracture.

In our study, although the patient was young, contracture developed due to a lack of communication and rehabilitation.

### **Conclusion**

In fingertip injuries, there are many reconstructive treatment options such as V-Y advancement flap, composite graft, digital artery perforator flaps, etc. It is important to obtain an optimum functional finger for the patient, a finger that does not experience loss of fingertip sensation and that looks the closest to normal in terms of cosmetics.

In this case report, in which reconstruction of the fingertip injury was performed utilizing hypothenar flap and followed up in the flexion position for 3 weeks, it was noted that significant flexion contractures were developed not only in the 5th finger but also in the 2nd-4th fingers.

Although flexion contracture and tenderness in the proximal interphalangeal joint related to hypothenar flaps are frequently reported complications, the literature reports that severe contracture developed significantly in the non-injured fingers as in our case, which is extremely rare [7].

### **Scientific Responsibility Statement**

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.*

### **Animal and human rights statement**

*All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.*

### **Conflict of interest**

*None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.*

### **References**

1. Barbato BD, Guelmi K, Romano SJ, Mitz V, Lemerle JP. Thenar flap rehabilitated: a review of 20 cases. *Ann Plast Surg.* 1996;37(2):135-9.
2. Mitsunaga N, Mihara M, Koshima I, Gonda K, Takuya I, Kato H, et al. Digital artery perforator (DAP) flaps: Modifications for fingertip and finger stump reconstruction. *J Plast Reconstr Aesthet Surg.* 2010;63(8):1312-7
3. Sungur N, Kankaya Y, Yıldız K, Dölen UC, Koçer U. Bilateral V-Y rotation advancement flap for fingertip amputations. *Hand (N Y).* 2012;7(1):79-85.
4. Matsui J, Piper S, Boyer MI. Nonmicrosurgical options for soft tissue reconstruction of the hand. *Curr Rev Musculoskelet Med.* 2014;7(1):68-75.
5. Mutlu OO, Colak O, Dilber A, Bingol D, Egemen O. Complicated fingertip defects: clinical approach to their reconstruction and the flaps that can be used in emergency settings. *Turk Plastik.* 2019;27:14-18.
6. Gupta, Saurabh et al. Keystone Flap for Postburn Finger Flexion Contracture Release. *Journal of cutaneous and aesthetic surgery.* 2021;14(1):125-8.
7. Hong JP, Lee S-J, Lee H-B, Chung YK. Reconstruction of fingertip and stump using a composite graft from the hypothenar region. *Ann Plast Surg.* 2003; 51(1):57-62.

### **How to cite this article:**

*Harun Köse, Serhat Ekrem, Ahmet Sağır, Ersen Türkmen, Kadir Ertem. Flexion contracture in 2-5 digits following hypothenar flap. Ann Clin Anal Med 2022;13(Suppl. 2):S127-129*